

WHAT IS CLAIMED IS:

1. A work station for an electrical discharge machining apparatus, comprising:

(a) a first mechanism for retaining a workpiece in a predetermined position;

(b) at least one electrode for forming a feature on said workpiece; and,

(c) a second mechanism for positioning said electrode in a manner that is
5 movable into and out of engagement with a designated portion of said
 workpiece;

wherein a portion of said second mechanism is connected to said first mechanism so
as to automatically align said electrode with said designated portion of said
workpiece.

10 2. The work station of claim 1, wherein said second mechanism is configured so that
said electrode is electrically insulated from said workpiece.

3. The work station of claim 1, said second mechanism further comprising:

(a) a stationary first portion including a plurality of shaft members retained in
a shaft housing, wherein said shaft members are arranged in a
15 predetermined spaced relation;

(b) a second portion for retaining and positioning said electrode, said second
portion including a plurality of openings therein which are slidably
positioned on said shaft members; and,

(c) a bearing positioned between a surface defining each said opening in said second portion and each said shaft member, wherein said bearings have electrically insulating properties.

4. The work station of claim 3, said shaft housing of said first portion for said second mechanism including a male portion configured so as to be retained in a corresponding mating portion provided in said first mechanism.

5. The work station of claim 4, said shaft housing being configured so that said male portion interfaces with said mating portion of said first mechanism in a direction substantially perpendicular to movement of said second portion of said second mechanism.

6. The work station of claim 3, said first mechanism including an opening configured to retain said shaft housing.

7. The work station of claim 3, said first mechanism including a slot configured to retain said shaft housing.

8. The work station of claim 3, said bearings including a plurality of grooves formed in an inner surface thereof so as to permit fluid flow therethrough.

9. The work station of claim 3, said second portion of said second mechanism further comprising:

(a) a locator plate including a plurality of openings formed therein, each of said openings having one of said bearings positioned therein so that said locator plate is slidably positioned on said shaft members;

(b) a holder plate configured for retaining said electrode in a predetermined position and orientation; and,

(c) at least one clip member for connecting said holder plate to said locator plate.

5 10. The work station of claim 9, said holder plate including a plurality of openings formed therein adjacent said electrode to permit fluid flow therethrough.

11. The work station of claim 10, said second mechanism further comprising a base member positioned adjacent said holder and locator plates, said base member including a plurality of openings formed therein which also receive each said bearing
10 so that said base member is slidable on said shaft members.

12. The work station of claim 11, said base member including a pocket formed therein in flow communication with said openings in said holder plate.

13. The work station of claim 1, said second mechanism being oriented with respect to said first mechanism so as to permit said electrode to form a feature in a side
15 portion of said workpiece.

14. The work station of claim 1, further comprising a third mechanism located on an opposite side of said first mechanism as said second mechanism, said third mechanism positioning a second electrode in a manner that it is movable into and out of engagement with a second designated portion of said workpiece, wherein a portion
20 of said third mechanism is connected to said first mechanism so as to automatically align said second electrode with said second designated portion of said workpiece.

15. The work station of claim 14, wherein said third mechanism is configured so that

said second electrode is electrically insulated from said workpiece.

16. The work station of claim 1, said first mechanism further comprising:

(a) a base portion for supporting said workpiece; and

(b) a housing positioned adjacent and connected to said base portion, said housing including at least one locator member for aligning said workpiece in a first direction.

17. The work station of claim 16, said base portion of said first mechanism further comprising:

(a) a first base plate positioned adjacent said housing;

(b) a second base plate positioned in spaced relation to said first base plate; and,

(c) at least one spacer member positioned between said first and second base plates;

wherein at least one of said first and second base plates includes a locator member at an end adjacent said second mechanism so as to align said workpiece in a second direction.

18. The work station of claim 17, said first mechanism further comprising at least one spacer member positioned adjacent said housing opposite said first base plate, each spacer member including an arm portion extending beyond said base portion having an opening formed therein which retains a male portion of said second mechanism.

19. The work station of claim 3, said second mechanism including at least two shaft members positioned in spaced, parallel relation to each other.

20. The work station of claim 3, said second mechanism including three shaft members positioned in spaced, substantially triangulated relation to each other.

5 21. An electrical discharge machining apparatus for forming features in a workpiece, comprising:

(a) a dielectric tank;

(b) at least one work station disposed in said tank, each said work station further comprising:

10 (1) a first mechanism for retaining a workpiece in a predetermined position;

(2) at least one electrode for forming a feature on said workpiece; and,

15 (3) a second mechanism for positioning said electrode in a manner that it is movable into and out of engagement with a designated portion of said workpiece, wherein a portion of said second mechanism is connected to said first mechanism so as to automatically align said electrode with said designated portion of said workpiece;

(c) a device for supplying power to said electrode; and,

(d) a device for controlling the position of said second mechanism.

22. A method of electrical discharge machining a workpiece in a work station, comprising the following steps:

- (a) providing a first mechanism for retaining said workpiece in a predetermined position;
- 5 (b) providing at least one electrode;
- (c) providing a second mechanism for positioning said electrode in a desired manner;
- (d) connecting said first mechanism and a first portion of said second mechanism so as to automatically align said electrode with a designated
10 portion of said workpiece;
- (e) electrically insulating said electrode from said workpiece;
- (f) loading said workpiece into said first mechanism; and,
- (g) moving a second portion of said second mechanism with respect to said first mechanism so that said electrode is brought into and out of
15 engagement with said workpiece to form a desired feature therein.